Statement of Work

March 30, 2007

Digital Collection of Montana Historic Districts and Sites

Master Contract CEP 07-DOA-GIS-16

MT Department of Administration/ITSD With Assistance from the State Historic Preservation Office and GCS Research, LLC

Table of Contents

Project Title 1
Project Manager – Contractor 1
Project Manager – Agency 1
Project/Task Objectives and Requirements 2
Scope of Work, Deliverables and Acceptance Criteria 2
Timeline and Period of Performance 4
Compensation and Payment 4
Contractor Staff, Roles and Responsibilities 5
Agency Staff, Roles and Responsibilities 5
Contractor Performance Assessments 5
Additional Terms and Conditions Specific to this SOW 5
Execution/Signature Block 6
Appendix A - Contractor Response to CEP 7

Statement of Work

Project Title

Digital Collection of Historic Districts and Sites

This work is being performed under 06-1263B, Master contract for IT Services.

This Statement of Work (SOW) is made and entered by and between the Montana Department of Administration, ITSD (Agency) and GCS Research, LLC (Contractor). This SOW incorporates by reference the terms and conditions of Contract Number 06-1263B in effect between the State and GCS Research, LLC. This SOW also incorporates by reference the GCS Research, LLC response to the Contractor Engagement Proposal as Appendix A. In case of any conflict between this SOW and the Contract, the Contract shall prevail. The Agency and Contractor agree as follows:

Project Manager – Contractor

The Contractor's Project Manager is:

Name: Michael Beltz
Address: 1121 East Broadway, Suite 113
City: Missoula
State & Zip: Montana 59802
Phone: 406-532-3254
Cell: 406-546-6759
Fax: 406-532-3255
Email: mbeltz@gcs-research.com

Project Manager – Agency

The Agency's Project Manager is:

Name: Stewart Kirkpatrick
Address: Weinstein Bldg, Suite 2, 101 N. Rodney
City: Helena
State & Zip: MT, 59601
Phone: 406-444-9013
Cell: 406-202-2526
Fax: 406-444-1255
Email: skirkpatrick@mt.gov

The State Historic Preservation Office's Project Manager is:

Name: Mark Baumler
Address: 1410 Eighth Avenue
City: Helena

State & Zip: MT, 59620-1202
Phone: 406-444-7717
Cell:
Fax: 406-444-6575
Email: mbaumler@mt.gov

Project/Task Objectives and Requirements

The objective of this project is to digitally collect approximately 300 National Register listed historic districts and approximately 700 properties located both within and outside those historic districts. These records are collected and maintained by the State Historic Preservation Office (SHPO). Digital representation of these records is important not only to SHPO, but potentially to the Governor's Montana Means Business website and other applications.

The requirements for this project are described in the following section - Scope of Work, Deliverables and Acceptance Criteria

Scope of Work, Deliverables and Acceptance Criteria

Contractor shall provide Services and staff, and otherwise do all things necessary for or incidental to the performance of work, as set forth below:

Contractor shall provide:

1. Deliverable 1 - An ArcGIS 9.2 geodatabase containing a polygon feature of the Montana Historic Districts contained in the Montana Historical & Architectural Inventory Archive. County lists of the districts to be collected are available at http://mhs.mt.gov/shpo/register/NRmap/NRmap.htm . The Historic District maps contained within the Archive vary widely in quality and detail, some being hand drawn on USGS 1:24,000 quads and some delineated by UTM coordinates for the corners. The record however does contain a written description of the boundaries of each district. Some written descriptions are quite detailed while others may be vague. Deliverable 1 is expected to be an accurate depiction of the archived record; however it is not expected to be of legal description quality. The Montana Framework Cadastral Database shall be used as the base map for the districts although the contractor may use additionally available digital data to locate the district. During initial collection the Contractor will flag those districts where existing maps and written descriptions do not provide adequate information to map them. The Contractor will compile FGDC compliant metadata for deliverable 1.

For each polygon created in deliverable 1, the database will contain the following attributes:

Unique Identifier (consists of Provider ID, Dataset ID, and Unique ID)
Smithsonian #
Historic Name
Date as listed in the National Register
NPS Reference #

The contractor will be given the Provider ID and the Dataset ID by the Agency. The Unique ID will be the Smithsonian #.

2. Deliverable 2 - a point feature class and polygon feature class within the geodatabase created in deliverable 1, containing individual sites within the Historic Districts and other selected sites. County lists of the sites to be collected are available at http://mhs.mt.gov/shpo/register/NRmap/NRmap.htm. Records of these sites are contained in the Montana Historical & Architectural Inventory Archive. The records describing the sites within each district usually contain an address providing the site is in an urban area. If the record is more rural in nature there will be a description or map of where it is located. The location of the point shall be placed in the correct cadastral database parcel where applicable and contain the Department of Revenue geocode of that parcel in the attribute table described below. In places where the cadastral database and the 2005 NAIP photography line up, it is preferable to place the point on the structure within the parcel if it is identifiable. During initial collection the Contractor will flag those sites where existing maps and written descriptions do not provide adequate information to map them. The Contractor will compile FGDC compliant metadata for deliverable 2.

There are very few sites that are polygonal in nature. SHPO will compile a list of those features.

For each point or polygon created in deliverable 2, the database will contain the following attributes:

Unique Identifier (consists of Provider ID, Dataset ID, and Unique ID)
Smithsonian #
Historic Name
Address
Date as listed on the National Register
NPS Reference

The contractor will be given the Provider ID and the Dataset ID by the Agency. The Unique ID will be the Smithsonian #.

The Contractor shall schedule a **kick-off meeting** with the Agency and SHPO before starting work on the project. After initial collection the Contractor shall schedule a **collection review meeting** with the agency to review all records the contractor has identified as having insufficient information to map.

Weekly Progress Reports
In addition to the two deliverables the Contractor will provide the agency project manager a short weekly reports describing progress and status of the project.

Acceptance Criteria
During the collection review meeting, the Contractor, Agency, and SHPO will examine the contractor flagged parcels and their corresponding records. The Contractor, Agency and SHPO will agree on a list of those districts or sites that have insufficient information to properly map. The agency and SHPO will have the option to locate and provide the contractor with the additional and sufficient information to properly map the properties.

Upon delivery of deliverable 1 the Agency and SHPO will review a 10 percent sample of the mapped Historic Districts to see that they adequately represent the hardcopy map and written description of those districts. If the 10 percent sample is determined by the Agency and SHPO to adequately represent the existing depictions of the district, the entire deliverable will be accepted. If discrepancies are found that are totally unacceptable, the Contractor, Agency and SHPO will examine those discrepancies and attempt to come to a negotiated solution. The Agency acknowledges that the contractor will encounter maps and written descriptions that will be difficult to map precisely.

Upon delivery of deliverable 2 the Agency and SHPO will review a 10 percent sample of the mapped sites to see that they adequately represent the written description of those sites. For sites on properties where a geocode can be determined by address, 100 percent of those sites should fall within the corresponding parcel. If the 10 percent sample is determined by the Agency and SHPO to adequately represent the existing depictions of the sites, the entire deliverable will be accepted. If discrepancies are found that are totally unacceptable, the Contractor, Agency and SHPO will examine those discrepancies and attempt to come to a negotiated solution. The Agency acknowledges that the contractor will encounter written site descriptions that will be difficult to map precisely.

Timeline and Period of Performance

The period of performance for this project will start on the date of contract signing and the work tasks are estimated to continue through August 1, 2007. The Department has the right to extend or terminate this SOW at its sole discretion. Contractor will be expected to adhere to their proposed timeline submitted during contract negotiations unless the Contractor and the Department mutually agree to changes.

Compensation and Payment

Contractor's compensation for services rendered shall be based on Contractor's Prices as set forth in their response to the CEP 07-DOA-GIS-16 solicitation entitled "Digital Collection of Montana Historic Preservation Districts and Sites".

1. **Deliverable 1 - An ArcGIS 9.2 geodatabase containing a polygon feature of the Montana Historic Districts** - $10,962.50

2**. Deliverable 2 - A point feature class and polygon feature class within the geodatabase created in deliverable 1, containing individual sites within the Historic Districts and other selected sites** - $17112.50

Upon completion and final acceptance of **Deliverable 1** the Contractor may bill for the total cost of this deliverable less a 20% holdback

Upon completion and final acceptance of **Deliverable 2** the Contractor may bill for the total cost of this deliverable, and the holdback from deliverable 1.

No travel expenses are expected or authorized. All travel and logistical costs should be included in Contractor's price for authorized services in accordance with the terms and conditions of Contract Number 06-1263B in effect between the State and GCS Research, LLC.

Contractor Staff, Roles and Responsibilities

Staff assigned to this project will be John Waterman- Director of Geospatial Services, Miles Wacker- Senior Geospatial Analyst, Marcus Reddish- Geospatial Analyst and Michael Beltz- Director of Salesand Marketing.

John Waterman will serve as the GCS internal manager of this project, while both Miles Wacker and Marcus Reddish will be responsible for the geodatabase creation for deliverables one and two. Michael Beltz, will serve as liaison between GCS Research and the Agency and SHPO.

Agency Staff, Roles and Responsibilities

Stewart Kirkpatrick will be the overall Agency Project Manager responsible for contract and compensation issues. Mark Baumler, State Historic Preservation Office, will be responsible for the acceptance of data related deliverables.

Contractor Performance Assessments

Assessments**.** The State may do assessments of the Contractor's performance. Contractor's will have an opportunity to respond to assessments, and independent verification of the assessment may be utilized in the case of disagreement.

Record. Completed assessments may be kept on record at ITSD and may serve as past performance data. Past performance data will be available to assist agencies in the selection of IT service providers for future projects. Past performance data may also be utilized in future procurement efforts.

Additional Terms and Conditions Specific to this SOW

None

Execution/Signature Block

In Witness Whereof, the parties hereto, having read this SOW 07-DOA-GIS-16, Historic Districts, and Contract Number SPB06-1263B in its entirety, do agree thereto in each and every particular.

Approved	Approved
DOA, ITSD	GCS Research, LLC
Signature	Signature Michael Beltz
Dick Clark Print or Type Name	Print or Type Name
CIO Title	Director of Sales and Marketing Title
Date	April 3, 2007 Date

Appendix A - Contractor Proposal

Response to:

Digital Collection of Montana Historic Districts and Sites

Master Contract CEP

07-DOA-GIS-16

MT Department of Administration/ITSD

With Assistance from the State Historic Preservation Office

March 7, 2007

Submitted by:

GCS Research

GCS Research
1121 East Broadway, Suite 113
Missoula, Montana 59802
www.gcs-research..com
Contact: Michael Beltz
Phone: 406-532-3254

TABLE OF CONTENTS

1.0 SOW UNDERSTANDING……..3

2.0 PROJECT PLAN……4

3.0 SAMPLE PROJECTS……...……10

4.0 SCHEDULE ……..18

5.0 RESOURCES AND STAFF……20

6.0 PROJECT COST……25

SOW UNDERSTANDING

1.0 SOW UNDERSTANDING

GCS-Research has read and understands the Statement of Work. The objective of this project is to digitally collect approximately 300 National Register listed historic districts and approximately 700 properties located both within and outside those historic districts. These records are collected and maintained by the State Historic Preservation Office (SHPO). Digital representation of these records is important not only to SHPO, but potentially to the Governor's Montana Means Business website and other applications. GCS Research's understanding of the Statement of Work has been further supplemented by information received from the Montana State Historic Preservation Office. GCS Research has proven track record of providing similar services to Montana State Agencies.

PROJECT PLAN

2.0 Project Plan

The project work is broken into three main tasks:

1. Generate an ArcGIS 9.2 geodatabase containing a polygon feature class of the Montana Historic Districts contained in the Montana Historical & Architectural Inventory Archive.

2. Generate a point feature class and polygon feature class within the geodatabase depicting individual sites within the Historic Districts and other selected sites.

3. Project Management.

Deliverable One: ArcGIS 9.2 geodatabase containing a polygon feature of the Montana Historic Districts

GCS Research will utilize the County lists of the districts from the following web site.
http://mhs.mt.gov/shpo/register/NRmap/NRmap.htm

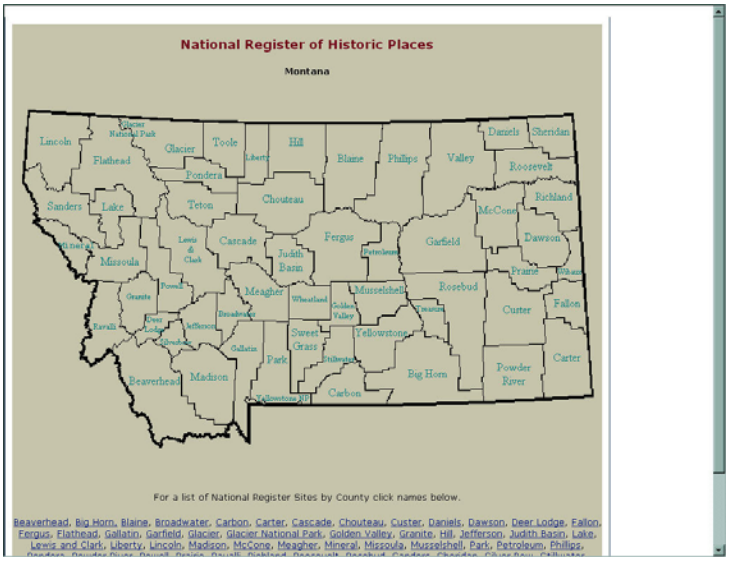


Figure 1- Source for Historic Site Descriptions

GCS Research understands the Historic District maps contained within the Archive vary widely in quality and detail, some being hand drawn on USGS 1:24,000 quads and some delineated by UTM coordinates for the corners. GCS will provide a deliverable that will be an accurate depiction of the archived record. The Montana Framework Cadastral Database will be used as the base map for the

districts, furthermore GCS Research will use additional available digital data to locate the district including color aerial photography from NAIP, and high resolution QuickBird satellite imagery from DigitalGlobe, maintained by GCS Research.

During initial collection, GCS Research will flag those districts where existing maps and written descriptions do not provide adequate information to map them. GCS Research will generate FGDC compliant metadata for the geodatabase deliverable.

GCS Research has accessed the Beaverhead County list of district and sites and understands this is in the final format that the remaining counties will be standardized on.

In addition to generating the polygon geometry of the districts, GCS Research will establish an associated attribute table that will contain the following fields with each record populated with the appropriate values:

- Unique Identifier (consists of Provider ID, Dataset ID, and Unique ID)
- Smithsonian #
- Historic Name
- Date as listed in the National Register
- NPS Reference #

The GCS Research methodology for Deliverable One will be "heads-up" digitizing with simultaneous attribute population. GCS Research will use a variety of base map datasets for geographic reference. The Montana Framework Cadastral Database will be the primary base map dataset and will be supplemented by color aerial photography from NAIP, and high resolution QuickBird satellite imagery from DigitalGlobe (where available). GCS Research has already assembled statewide NAIP. As feature class geometry is created, GCS Research will populate the attribute table records for the aforementioned fields. GCS Research will use ArcCatalog to establish the geodatabase schema and will digitize the polygons in ArcMap. The final geodatabase deliverable will include FGDC compliant metadata, generated using ArcCatalog.

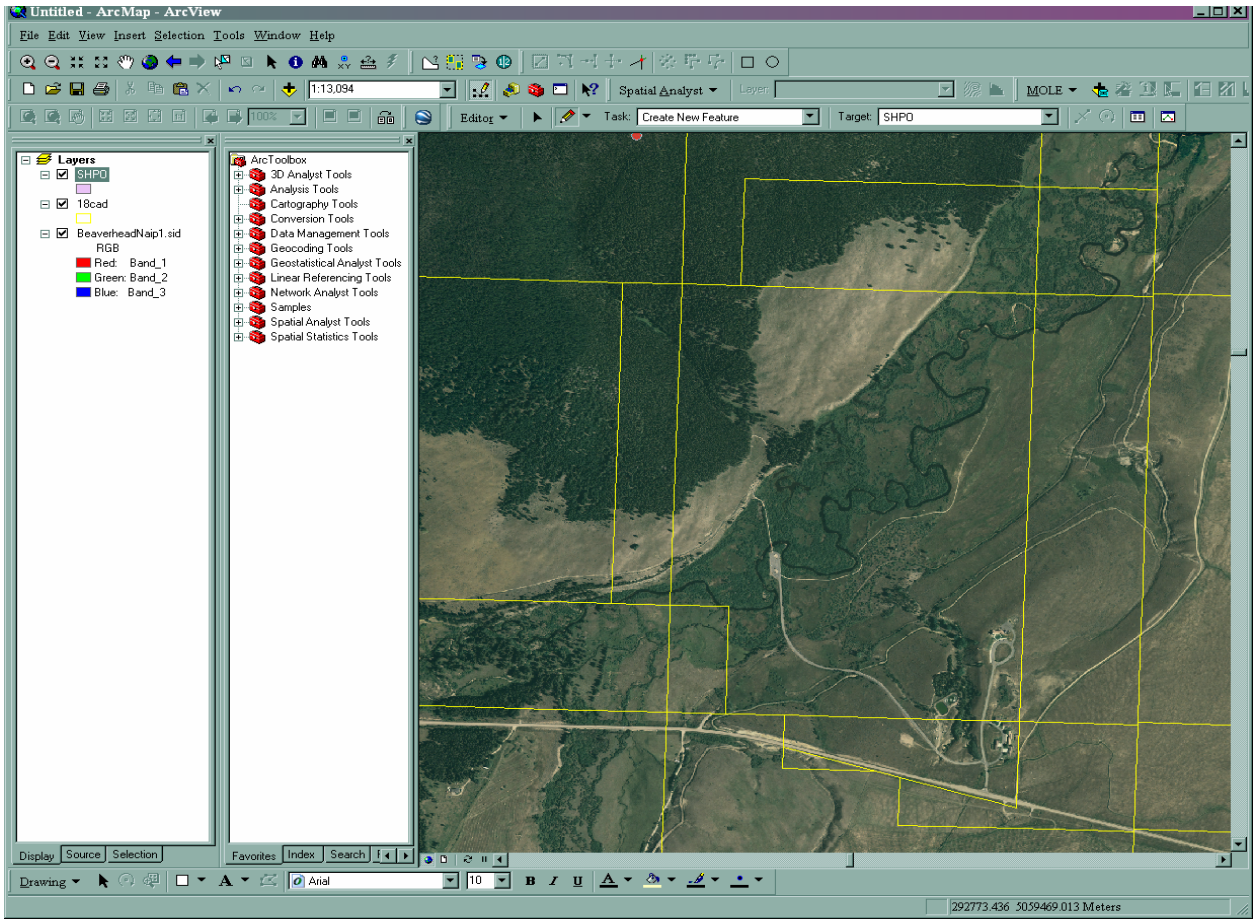
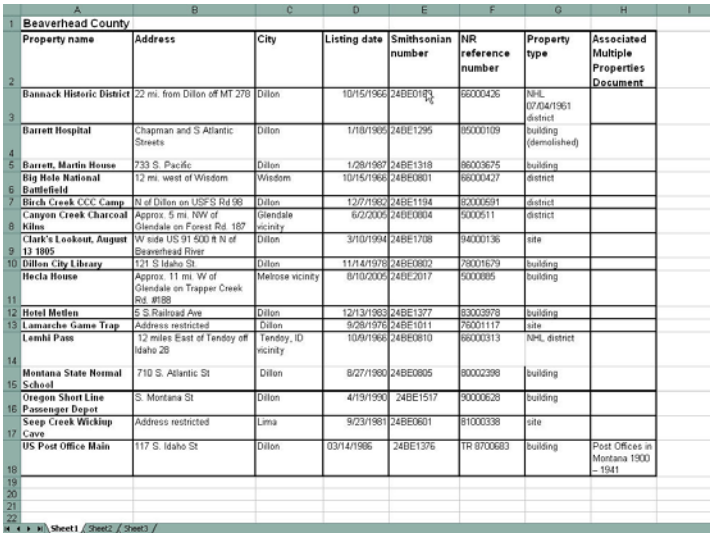


Figure 2- Big Hole National Battle Field. Polygon to be digitized using ArcMap Editor Toolbar with NAIP And Cadastral Data for boundary reference.

Deliverable Two - A point feature class and polygon feature class within the Deliverable One geodatabase depicting individual sites within the Historic Districts and other selected sites.

GCS Research will generate both a point feature class and a polygon feature class within the geodatabase created in deliverable one. These feature classes will contain individual sites within the Historic Districts and other selected sites.

GCS Research will obtain county lists of the sites to from http://mhs.mt.gov/shpo/register/NRmap/NRmap.htm.



Beaverhead County

Property name	Address	City	Listing date	Smithsonian number	NR reference number	Property type	Associated Multiple Properties Document
Bannack Historic District	22 mi. from Dillon off MT 278	Dillon	10/15/1966	24BE0018	66000426	NHL 07/04/1961 district	
Barrett Hospital	Chapman and S Atlantic Streets	Dillon	1/18/1995	24BE1295	95000109	building (demolished)	
Barrett, Martin House	733 S. Pacific	Dillon	1/28/1987	24BE1318	86003675	building	
Big Hole National Battlefield	12 mi. west of Wisdom	Wisdom	10/15/1966	24BE0801	66000427	district	
Birch Creek CCC Camp	N of Dillon on USFS Rd 98	Dillon	12/7/1982	24BE1194	82000591	district	
Canyon Creek Charcoal Kilns	Approx. 5 mi. NW of Glendale on Forest Rd. 187	Glendale vicinity	6/2/2005	24BE0804	5000511	district	
Clark's Lookout, August 13 1805	W side US 91 500 ft N of Beaverhead River	Dillon	3/10/1994	24BE1708	94000136	site	
Dillon City Library	121 S Idaho St	Dillon	11/14/1978	24BE0802	79001679	building	
Hecla House	Approx. 11 mi. W of Glendale on Trapper Creek Rd. #188	Melrose vicinity	8/10/2005	24BE2017	5000885	building	
Hotel Metlen	5 S Railroad Ave	Dillon	12/13/1983	24BE1377	83003978	building	
Lamarche Game Trap	Address restricted	Dillon	9/28/1976	24BE1011	76001117	site	
Lemhi Pass	12 miles East of Tendoy off Idaho 28	Tendoy, ID vicinity	10/9/1966	24BE0810	66000313	NHL district	
Montana State Normal School	710 S. Atlantic St	Dillon	8/27/1980	24BE0805	80002398	building	
Oregon Short Line Passenger Depot	S. Montana St	Dillon	4/19/1990	24BE1517	90000628	building	
Seep Creek Wickiup Cave	Address restricted	Lima	9/23/1981	24BE0601	81000338	site	
US Post Office Main	117 S. Idaho St	Dillon	03/14/1986	24BE1376	TR 8700683	building	Post Offices in Montana 1900 – 1941

Figure 3- Excel Spreadsheet of County Lists

GCS Research understands the records of these sites are contained in the Montana Historical & Architectural Inventory Archive. The records describing the sites within each district usually contain an address providing the site is in an urban area. If the record is more rural in nature there will be a description or map of where it is located. The location of the point shall be placed in the correct cadastral database parcel where applicable and contain the Department of Revenue geocode of that parcel in the attribute table described below. In places where the cadastral database and the 2005 NAIP photography line up, it is preferable to place the point on the structure within the parcel if it is identifiable. During initial collection the Contractor will flag those sites where existing maps and written descriptions do not provide adequate information to map them. The Contractor will compile FGDC compliant metadata for deliverable 2. GCS understands there are very few sites that are polygonal in nature. SHPO will compile a list of those features.

For each point or polygon created in deliverable 2, the database will contain the following attributes:

Unique Identifier (consists of Provider ID, Dataset ID, and Unique ID)

Smithsonian #

Historic Name

Address

Date as listed on the National Register

NPS Reference

GCS Research assumes it will be given the Provider ID and the Dataset ID by the Agency. The Unique ID will be the Smithsonian #.

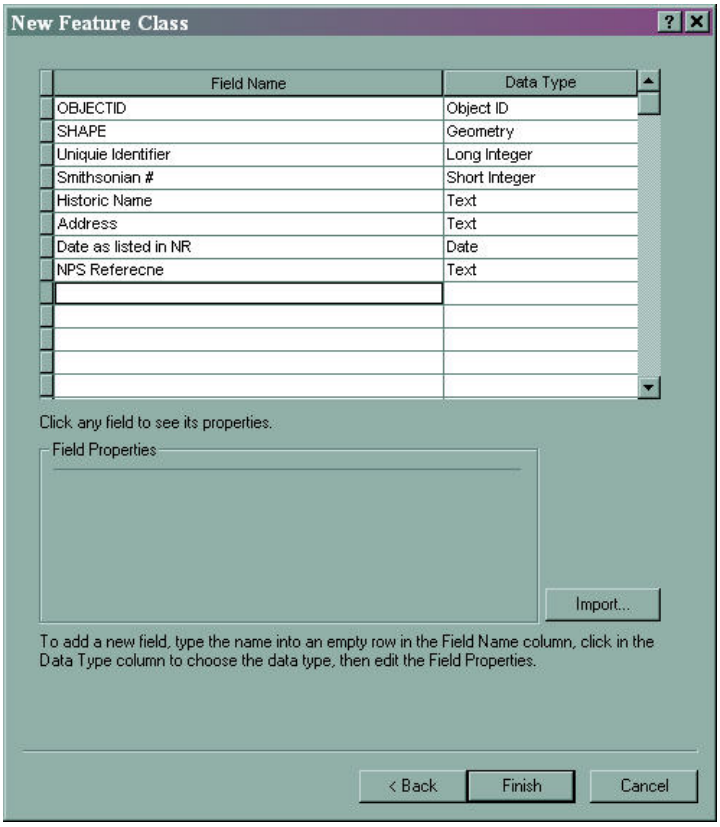


Figure 4- Attribute properties for the point feature class.

Project Management

GCS Research will schedule a kick-off meeting with the Agency and SHPO before starting work on the project. After initial collection GCS Research will schedule a collection review meeting with the agency to review all records the contractor has identified as having insufficient information to map. GCS Research will conduct these meetings onsite at the Agency office. Furthermore, GCS Research will provide the agency project manager short weekly reports describing progress and status of the project. These weekly reports will be submitted electronically via email and may be supplemented with brief web-meetings to review the status of deliverables.

During the collection review meeting, GCS Research, Agency, and SHPO will examine the flagged parcels and their corresponding records. GCS Research, Agency and SHPO will agree on a list of those districts or sites that

have insufficient information to properly map. The agency and SHPO will have the option to locate and provide GCS Research with the additional and sufficient information to properly map the properties.

Upon delivery of deliverable 1 the Agency and SHPO will review a 10 percent sample of the mapped Historic Districts to see that they adequately represent the hardcopy map and written description of those districts. If the 10 percent sample is determined by the Agency and SHPO to adequately represent the existing depictions of the district, the entire deliverable will be accepted. If discrepancies are found that are totally unacceptable, GCS Research, Agency and SHPO will examine those discrepancies and attempt to come to a negotiated solution. GCS understands that the Agency acknowledges that the contractor will encounter maps and written descriptions that will be difficult to map precisely.

Upon delivery of deliverable 2 the Agency and SHPO will review a 10 percent sample of the mapped sites to see that they adequately represent the written description of those sites. For sites on properties where a geocode can be determined by address, 100 percent of those sites should fall within the corresponding parcel. If the 10 percent sample is determined by the Agency and SHPO to adequately represent the existing depictions of the sites, the entire deliverable will be accepted. If discrepancies are found that are totally unacceptable, GCS Research, Agency and SHPO will examine those discrepancies and attempt to come to a negotiated solution. GCS understands that the Agency acknowledges that the GCS Research will encounter written site descriptions that will be difficult to map precisely.

3.0 SAMPLE PROJECTS

GCS Research brings a wealth of experience to this project. As an ESRI Business Partner, Developer Partner and Beta Test partner, GCS Research understands the full spectrum of geodatabase development and associated FGDC compliant metadata generation.

Montana Fish Wildlife and Parks

The most relevant project that GCS Research has completed as it pertains to this Scope of Work, is the State Parks Kiosks Project for the Montana Department of Fish and Wildlife. This project entailed the digitization of:

- Park Boundaries
- Roads
- Buildings- Restrooms, shelters, cabins
- Boat Ramps
- Campgrounds
- Streams/Lakes
- Points of Interest
- Trails

These feature classes were digitized for all of Montana's 50 State Parks and delivered as an electronic geodatabase, electronic Adobe Illustrator files (to be used by MTFWP graphics department) and as hard copy paper maps. The methodology for digitizing the MTFWP identified features is very similar to the methodology GCS Research proposes for this Scope of Work. GCS took delivery of hard copy maps from the MTFWP and text descriptions of the feature locations. GCS digitized all features using the "heads-up" method with ESRI ArcGIS ArcMap software. Points, lines and polygons were digitized for each State Park, by using background base map data obtained from the Montana State Library Natural Resource Information System (NRIS). Background base map data included USGS Digital Raster Graphics (DRGs), Digital Orthophoto Quarter Quadrangles (DOQQs) and GCS Research's existing archive of high-resolution satellite imagery (digital Globe QuickBird).

Each of the features digitized by GCS Research were delivered with associated attribute information. Defined by the MTFWP, the attribution included ADA accessibility status, feature/facility type and name. All features were delivered as an ESRI personal geodatabase in Montana State Plane projection, North

American Datum 1983, units meters. GCS Research generated FGDC compliant metadata for each feature class in the geodatabase. In addition to the geodatabase deliverable, GCS Research provided georeferenced JPEG images of the Kiosk Map graphics.

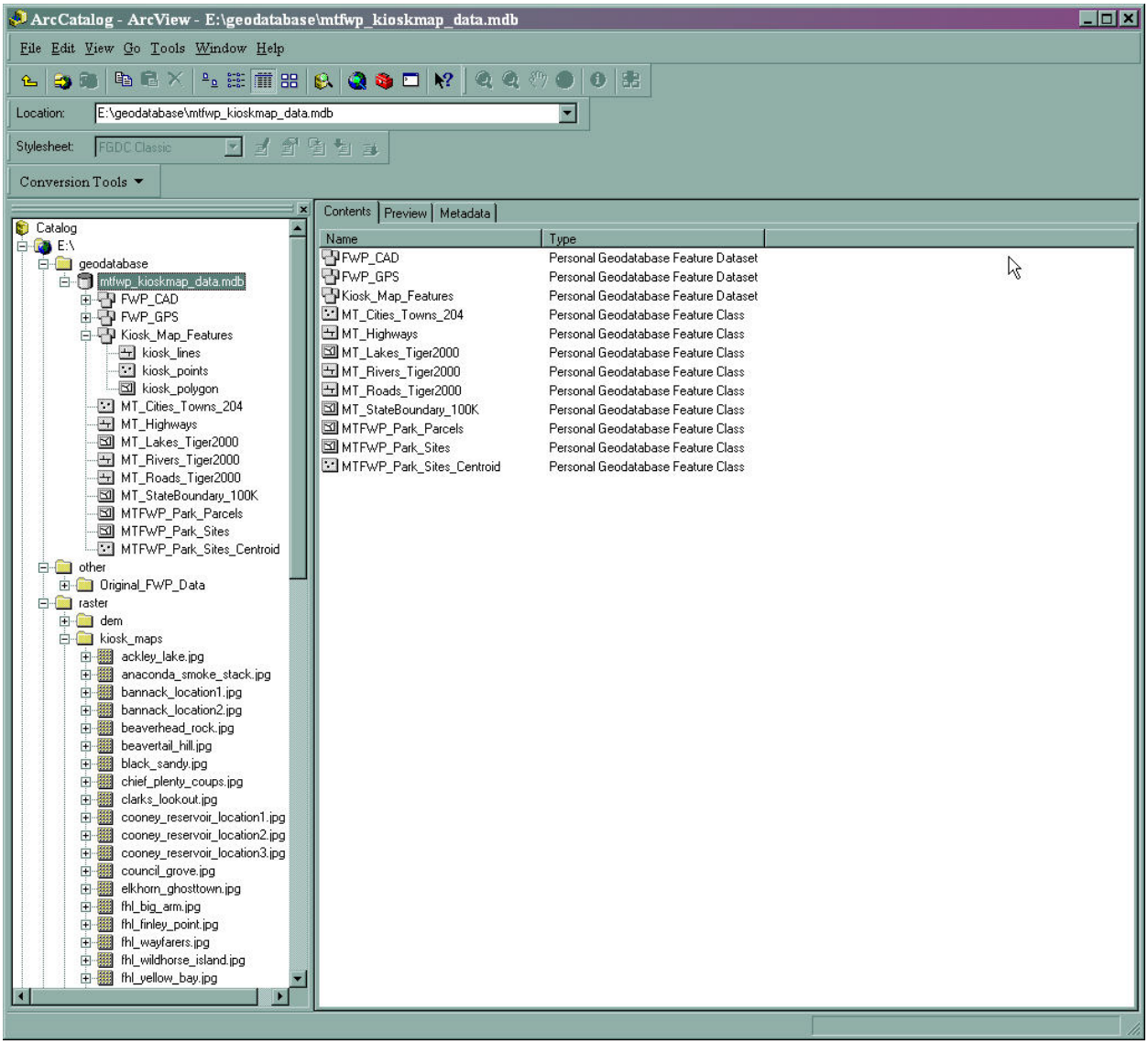


Figure 5- MTFWP Geodatabase deliverable viewed in ArcCatalog

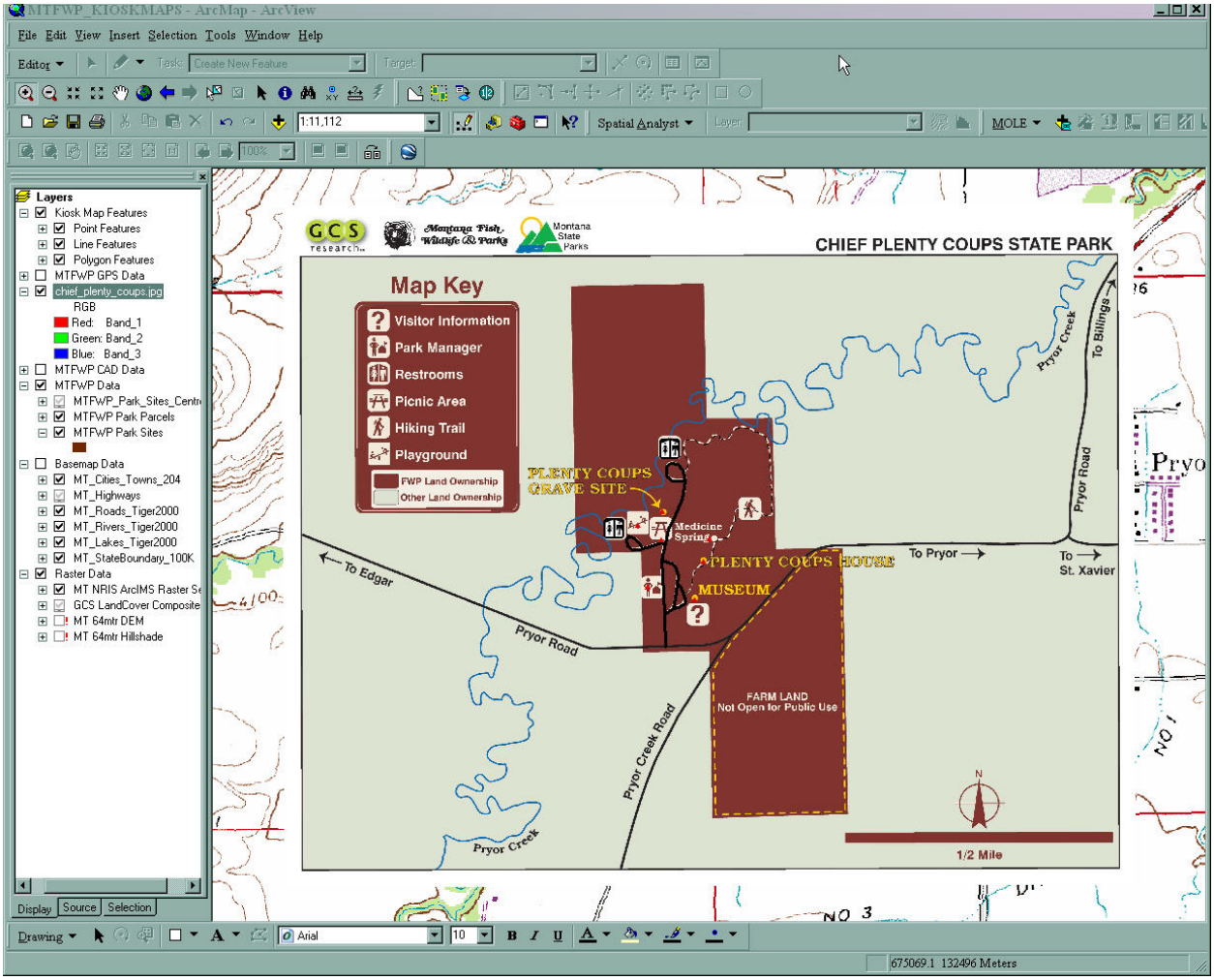


Figure 6- Georeferenced JPEG image viewed in ArcMap. All features on the graphic reside in the geodatabase.

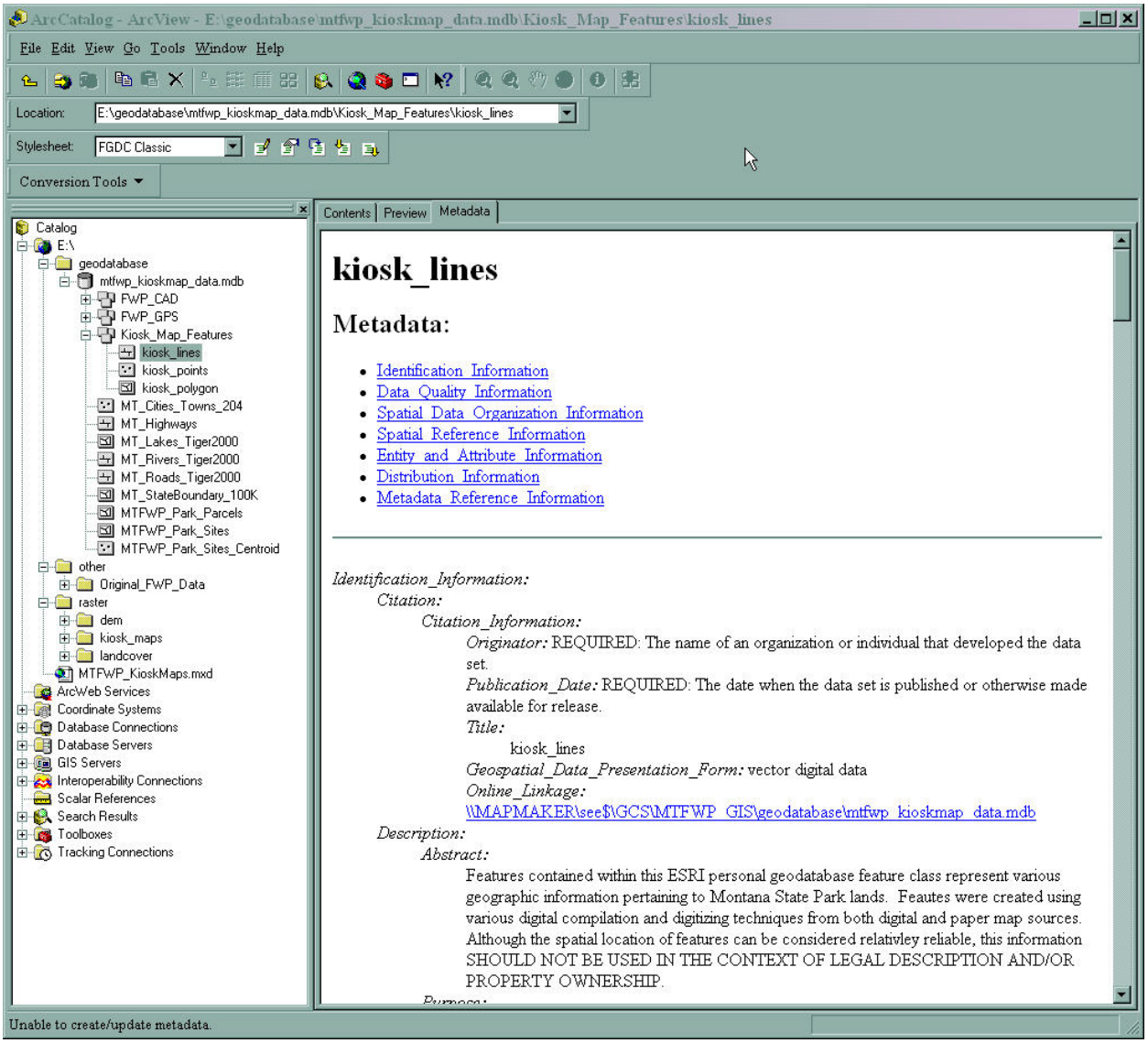


Figure 7- FGDC compliant metadata delivered with MTFWP geodatabase viewed in ArcCatalog.

The MTFWP deliverable generated by GCS Research is posted and available from the Montana State Library Natural Resource Information System (NRIS).

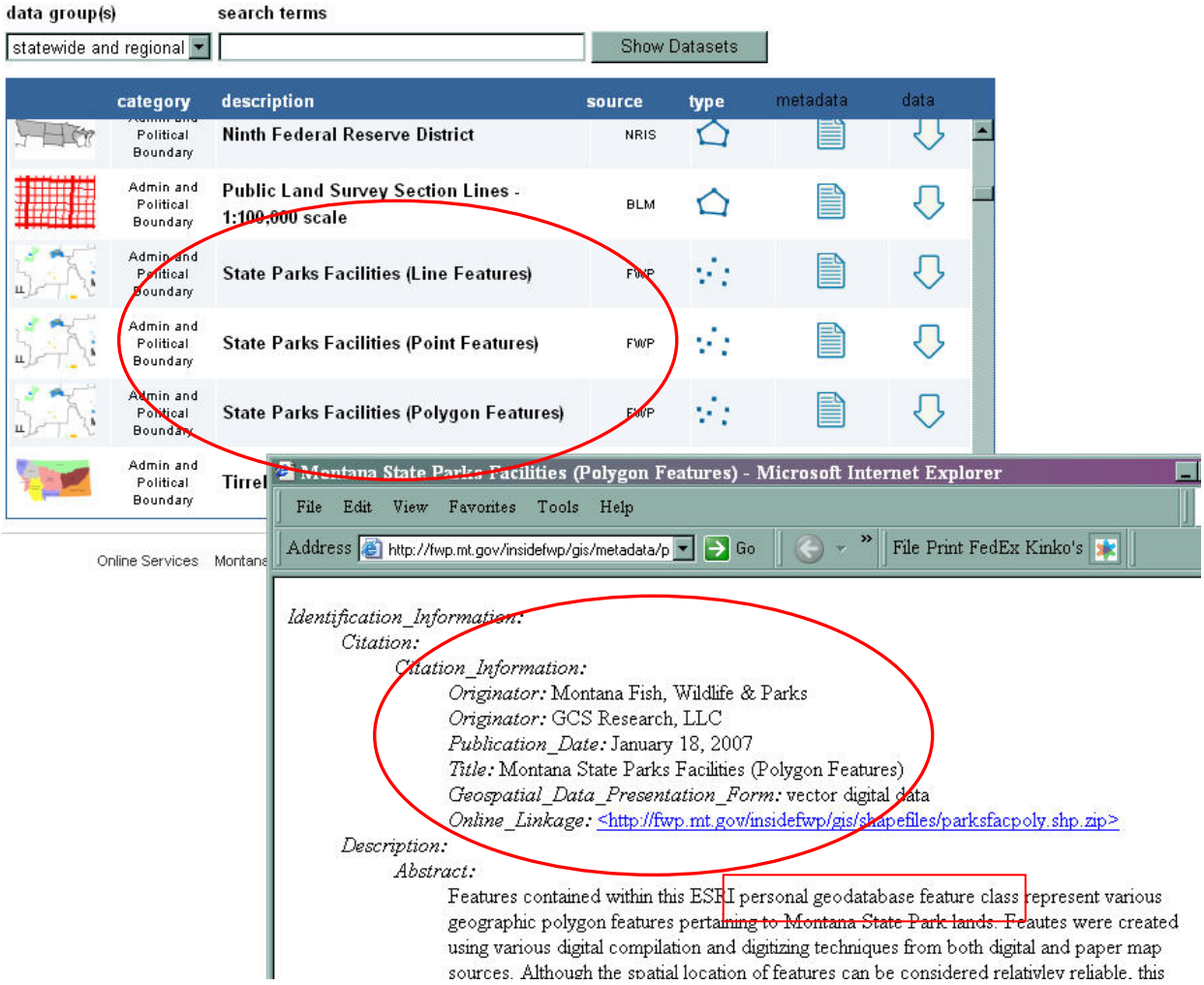


Figure 8- MTFWP Deliverable hosted on NRIS. Note- MTFWP or NRIS converted geodatabase feature classes to shapefiles.

Geodatabase Development for the City of Columbia Falls

GCS-Research designed a geodatabase for the conversion of existing AutoCAD utility drawing to feature class format for the City of Columbia Falls Public Works Department. GCS-Research migrated the City of Columbia Falls' water, sewer, and storm AutoCAD files to the geodatabase. GCS-Research developed a data model that reflected the structure of the City's water, sewer and storm utility system. The final deliverable was an ESRI personal geodatabase with network topology. To complete this project, GCS Research conducted an assessment of Columbia Falls utility system modeling needs. GCS Research documented how the AutoCAD data was represented, then defined the data components required to adequately model the system to support the process of Columbia Falls. GCS Research built a logical data

model based on findings from the assessment. GCS employed an interactive process with the City of Columbia Falls to determine when the data requirements were correctly modeled and complete.

Once the data requirements were modeled and approved by the City of Columbia Falls, . GCS Research built the physical dataset from the logical data model. This included topological relationships. After planning and designing the logical data model, GCS Research implemented the geodatabase. GCS-Research customized UML in Visio, using CASE tools to create an empty geodatabase, and then loaded Water, Sewer, and Storm data into the geodatabase. GCS-Research delivered the geodatabase electronically on CD-
ROM.

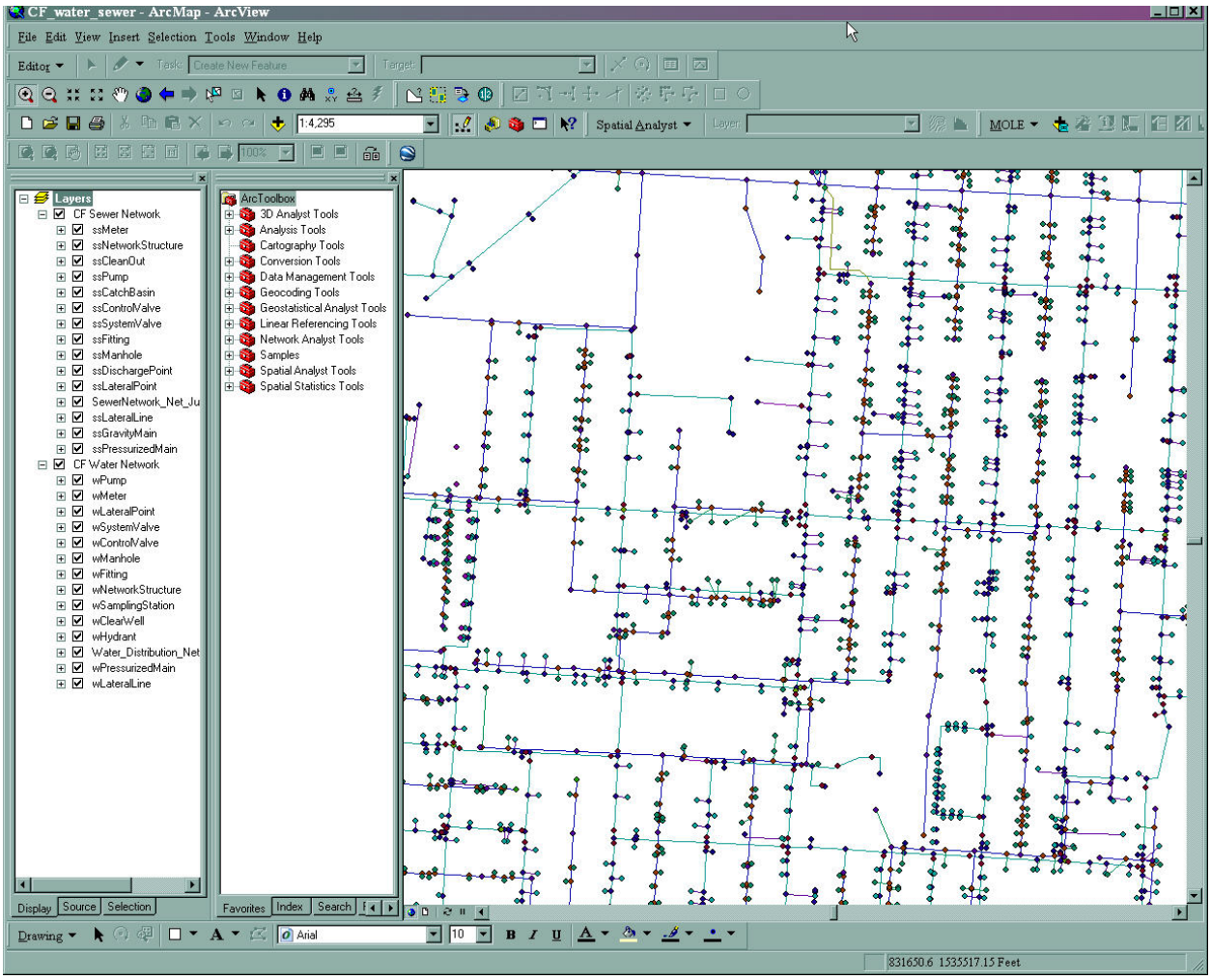


Figure 9- City of Columbia Falls Geodatabase viewed in ArcMap.

Montana Means Business

GCS Research has developed the "Montana Means Business" application for the Montana Governor's Office of Economic Opportunity. Currently hosted on GCS Research servers (We are actively working with ITSD to migrate to ITSD), the Montana Means Business will be delivered as a fully functional, customized geospatial Web application (Internet browser based) for the search, discovery, and delivery of relevant information (marketing, demographic, property) necessary to improve Montana-centric business decisions for multiple end users. It will provide a set of functional tools (graphic user interface – GUI) for the query of integrated geospatial Web services to provide relevant location intelligence necessary to promote economic development activity in the State of Montana. The Web application interface will conform to the standardized "look and feel" criteria for all official Internet-based applications. The data and functional requirement definitions are being developed in a phased, iterative approach, and will serve as the operative and scalable guidelines for the programming and delivery of the Web application utility. Montana Means Business is based upon a geospatial Service Oriented Architecture (SOA), and leverage Web service functionality to provide relevant location-based intelligence to the end user.

GCS Research developed a SOA-Geodatabase Architecture and Schema Definition. We established a web service by using an annual subscription to ESRI Business Analyst Web Service. The ArcWeb Service provides key demographic and business marketing information for the entire State of Montana. The ESRI Web service is integrated into the Web application. In addition to incorporating the Business Analyst Web service, GCS Research is working with ITSD and other parties as designated by the Office of Economic Opportunity to define the additional data requirements of the Montana Means Business (MMB) Web application. This includes any and all additional data layers that need may need to be included in the application as defined by the end-user requirements definition. As noted, a key Web service that will be integrated into the Web application will be the State of Montana cadastral Web service. The primary purpose here will be to determine the existing status of existing data layers such as the Transportation Framework data layer, etc. Status includes availability of data as a reliable Web service, database schemas, existing metadata, and its value for vital economic development information necessary for the end-user(s) of the application. The outcome of this component will be a master database schema based upon a Web service architecture for consumption by the browser application and browser functional requirements. The deliverable includes a scalable SOA-based geodatabase schema as a backbone for the Web application. GCS Research understands that the geodatabase deliverable will be considered as additional layer(s) to be consumed and incorporated into the Montana Means Business application. As the developer of this application, GCS Research has command knowledge of the appropriate geodatabase schema and feature class requirements for successful integration in to the web-portal.

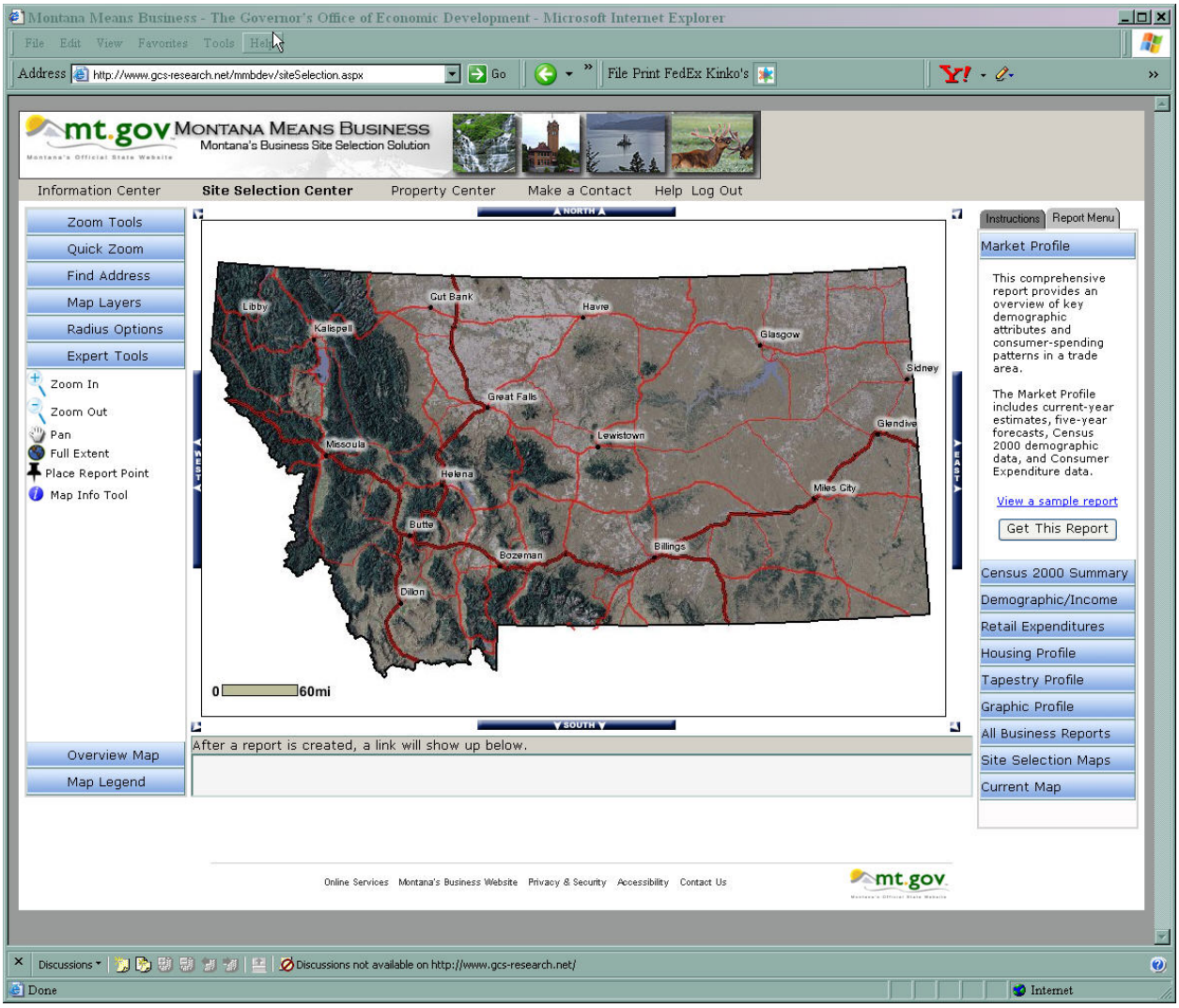


Figure 10- Montana Means Business Web application.

4.0 SCHEDULE

The overall schedule is a four month phased project that begins upon contract award. GCS Research agrees to meet the ultimate deadline of August 1, 2007 for the final deliverable as stated in the Master Contract CEP 07-DOA-GIS-16 Statement of Work. The following Schedule assumes an award date on or before April 1, 2007.

Tasks	Timing
1 Kick-off Meeting with Agency and SHPO	Week 1
2 Initial Data Collection Effort 2.1 Develop geodatabase schema 2.1.1 Obtain data from Montana Historical & Architectural Inventory Archive 2.1.2 Assemble Base Map Data 2.1.3 Begin development of a polygon feature of the Montana Historic Districts 2.2 Flag those districts where existing maps and written descriptions do not provide adequate information 2.3 Provide weekly progress report	Weeks 2 and 3
3 Collection Review Meeting	Week 4
4 Continued Geodatabase Development for Deliverable One and Two 4.1 Weekly Progress Report	Week 4
5 Continued Geodatabase Development for Deliverable One and Two 5.1 Weekly Progress Report	Week 5
6 Continued Geodatabase Development for Deliverable One and Two 6.1 Weekly Progress Report	Week 6
7 Continued Geodatabase Development for Deliverable One and Two 7.1 Weekly Progress Report	Week 7
8 Continued Geodatabase Development for Deliverable One and Two 8.1 Develop FDGC Compliant Metadata for Deliverable One 8.2 Weekly Progress Report	Week 8
Send Deliverable One for Review	Week 9
9 Work with SPHO if Discrepancies are found in Deliverable 1 or move towards acceptance 9.1 Weekly Progress Report	Week 10
10 Continued Geodatabase Development for Deliverable Two 10.1 Weekly Progress Report	Week 11
11 Continued Geodatabase Development for Deliverable Two	Week 12

11.1 Weekly Progress Report	
12 Continued Geodatabase Development for Deliverable Two 12.1 Develop FDGC Compliant Metadata for Deliverable One 12.2 Weekly Progress Report	Week 13
13 ***Send Deliverable Two for Review***	Week 14
14 Work with SPHO if Discrepancies are found in Deliverable 1 or move towards acceptance 14.1 Final Weekly Progress Report (If needed)	Week 15

5.0 RESOURCES AND STAFF

GCS Research is an ESRI Authorized Business Partner, Authorized Developer Partner, and ESRI Authorized Reseller. GCS Research has staff who are Authorized Instructors of ESRI software, including ArcGIS 9. GCS-Research has been awarded 2005 ESRI New Business Partner of the Year 2006 ESRI Business Partner of the Year and the 2007 ESRI Foundation Partner of the Year. GCS Research has, and has been selected as a Beta tester for ESRI technologies. GCS Research is a Microsoft Certified Partner and a Digital Globe Authorized Reseller. GCS Research is home to the Northern Rockies Geospatial Training Center in Missoula, Montana, specializing in ESRI and Microsoft Training curriculum.

GCS Research maintains corporate headquarters in the Montana Technology Enterprise Center in Missoula, Montana with satellite offices in Vermont, Oregon and Colorado. Our Missoula office employs the full suite of ESRI technology on multiple workstations and servers. We have the hardware and software required to successfully deliver on the Scope of Work. Staff assigned to this project will be John Waterman- Director of Geospatial Services, Miles Wacker- Senior Geospatial Analyst, Marcus Reddish- Geospatial Analyst and Michael Beltz- Director of Sale sand Marketing.

John Waterman will serve as the GCS internal manager of this project, while both Miles Wacker and Marcus Reddish will be responsible for the geodatabase creation for deliverables one and two. Michael Beltz, will serve as liaison between GCS Research and the Agency and SHPO.

John Waterman- Director of Geospatial Services

Mr. Waterman has been with GCS Research for three years and directs and manages GCS Research's services group.

Mr. Waterman brings a wealth of expertise and experience to GCS Research. He has worked for ESRI's Implementations Services in Redlands, California and the ESRI-Denver office where he provided consulting and technical services to clients working with ArcGIS, ArcIMS, and ArcSDE. While working for ESRI, John designed and implemented ArcIMS systems for: Qwest Communications; City of Fort Collins; Advisory Council on Historic Preservation; Colorado Department of Public Health and Environment; Forest Service, Rock Mountain Region; and Laramie County, WY; He also provided ArcIMS consulting services for: Tobin International; Los Angles County; Colorado Department of Water Resources; Larimer County, CO; City of Boulder; EPA, Denver, CO; Earth Tech, Inc., Denver, CO; City of Glendale, AZ; CBC Flood, Denver, CO; Colorado Division of Wildlife, Fort Collins, CO; SecureX Networks, Aspen, CO; and Arizona Dept. of Public Safety. Also while at ESRI, Mr. Waterman built custom ArcObjects desktop applications for the following clients: DOJ, Washington, DC; Phoenix Water Department; Forest Service, Rocky Mountain Region, Lakewood, CO; New Mexico Department of Transportation; Tucson Water, City of Tucson; AZ; USGS, NHD, Lakewood, CO; Qwest Communications. In addition, he provided ArcObjects consulting services for the following clients: Arizona Public Service, Phoenix, AZ, and ReVision Inc, Denver, CO.

Mr. Waterman has also served as an ArcSDE database administrator and ArcObjects programmer for an Enhanced 911 software company, microDATA GIS. Managing four production and numerous development multi-user enterprise geodatabases with approximately a dozen full-time editors, John was responsible for daily maintenance, trouble shooting, and designing/implementing back-up/recovery plans and versioning workflows. To further support editors, John developed custom ArcObject tools to facilitate loading data into a complex E911 geodatabase model. He also developed an ArcMap extension for managing/analyzing wireless data and a set of map production tools for building/maintaining atlases and wall maps.

Along with managing service projects at GCS Research, John has contributed system design and programming skills to projects involving current ESRI technologies such as ArcGIS Server web, mobile, and 3d clients. For example, a "pandemic geospatial analysis" web service was developed as part of a larger service-oriented architecture (SOA) that allowed multiple clients, such as web and mobile, to communicate real-time situational awareness during a pandemic flu outbreak. Other projects have ranged from custom web services for a utility "dig smart" industry client to web applications for the USGS Water Resources division.

Mr. Waterman earned a B.S. degree in Forest Management from Oregon State University and completed a M.S. in Forestry from the University of Montana.

Michael Beltz- Director of Sales and Marketing

Mr. Beltz has extensive experience working with geospatial technologies and serves as Director of Sales and Marketing for GCS Research. Mr. Beltz is an ESRI Authorized Training Partner (ATP) for ArcGIS 9.x instruction. This is a rigorous application process, whereby the successful candidate must demonstrate exemplary skills and knowledge of ESRI GIS software, as well as the ability to communicate and teach effectively. Mr. Beltz specializes in teaching introductory course for students who have had little or no experience using GIS.

Mr. Beltz brings over twelve years of professional experience to GCS-Research. He served as GIS Program Director for an international NGO, developing the GIS capacity for conservation organizations in Russia, Central Asia, and Chile. Working closely with the ESRI Conservation Program, Mr. Beltz's training and mapping activities include seminars in Russia's Far East Region and Central Siberia. He has worked in Vladivostok, Khabarovsk, The Republic of Yakutia and Russia's remote Sakhalin Island, Altai Republic, Turkmenistan, and Chile.

Mr. Beltz has completed numerous GIS products for publication including a four-color poster in three languages (Russian Japanese, English) entitled: "The Russian Far East: Hotspots and Protected Areas", Mike also generated maps for the companion book, Russian Far East: Protected Areas and Hotspots. Prior to joining GCS-Research, Mr. Beltz served as GIS director for Ecosystem Research Group, an environmental consulting firm based in Missoula, Montana. In this capacity, Mr. Beltz oversaw the

production of hundreds of maps and associated analysis for environmental investigations and contributed to award-winning Environmental Impact Statements. Mr. Beltz produced over a 125 maps for the Jefferson-Martin 230kV Transmission Line Environmental Impact Review for the California Public Utilities Commission.

In addition to his international conservation GIS work, Mr. Beltz worked for the Washington D.C. based, Bicycle Federation of America, where Mike was responsible for incorporating GIS tools and analysis into non-motorized transportation planning programs. He produced several cartographic products published in reports and plans.

In 2002, Beltz served as President for the International Society for Conservation GIS and is currently serving as a board member. He currently serves as treasurer and board member for the international NGO Big Sky Conservation Institute, whose work is focused on conservation GIS in the Russian Far East, Central Siberia and Mongolia.

Mr. Beltz has a BA from Alfred University in New York and has completed graduate coursework in Geography with and emphasis in Computer Cartography and GIS from the University of Montana.

Miles Wacker- Senior Geospatial Analyst

Miles Wacker is a graduate of the University of Montana Department of Geography. He has a Master's Degree in GIS and Computer Cartography. He has extensive knowledge of Geographic Information Systems and Global Positioning Systems technologies. Prior to his employment with GCS Research, Mr. Wacker has served an intern and consultant to GCS. In this capacity he has researched and compiled course materials for the Northern Rockies Geospatial Training Center, successfully designed and implemented geodatabases, rectified and extracted feature classes using CAD drawings, completed QA & QC for Internet GIS websites.

Miles has worked as a Survey Technician and has completed topographic, boundary, and construction surveys, Operated survey-grade Leica GPS and Garmin handhelds as well as Trimble GeoExplorer/Recon hardware.

As an intern with Park County, Montana, Miles succeeded in converting parcel information into digital form in conjunction with the Montana Cadastral Mapping Project

Education

Masters of Arts, Geography-Option: GIS/Cartography. University of Montana-Missoula, MT. Bachelor of Science, Earth Science-Concentration: Geography, Minor: Mathematics. **GPA: 3.42** Montana State University-Bozeman, MT.

Geographic Information Systems

- Extensive experience with spatial referencing and knowledge of cartographic principles
- Compiled and created data using digitizing and georeferencing techniques
- Experienced at creating, editing, and managing personal geodatabases, topology, and networks
- Knowledge of ArcSDE: administration, database creation and management, raster storage, table relationship, and spatial indexing
- Internet GIS: successfully created sites served by ArcSDE, HTML editing
- Raster GIS & Image Analysis: Feature Analyst, remote sensing principles, digital elevation models, digital orthophotos, mosaics, land-cover classifications

Software

- Experience with ArcGIS 9.x, 8.x, 3.x, and extensions: Spatial Analyst, 3D Analyst, ArcScan, Feature Analyst, Network Analyst, Business Analyst, ArcWeb Services, ArcHydro, TauDEM, Xtools; ArcIMS; ArcSDE; Golden Software's Surfer and MapViewer; Idrisi Kilimanjaro: ERDAS Imagine.
- Familiarity with the Microsoft Office Suite, Microsoft Visio and Visual Source Safe, Adobe Acrobat, Photoshop, Illustrator, AutoCAD.
- Knowledge of surveying equipment, GPS, and associated software: Trimble 3 Explorer, Pathfinder Office, Leica Total Stations, Garmin Etrex.

Additional GIS Training:

- Learning ArcIMS 4.0, Customizing ArcIMS 4.0, Learning ArcGIS 9 Spatial Analyst, Learning ArcGIS 8 3D Analyst, Working with Rasters in ArcGIS 8, Spatial Analysis of Geohazards using ArcGIS 8, Intro to ArcGIS 9 Geostatistical Analyst
- Understanding ArcSDE Table Relationships, Understanding the ArcSDE Spatial Indexing, Working with Water Utilities
- Cartography with ArcGIS

Marcus Reddish- Geospatial Analyst

Mr. Reddish brings valuable GIS experience to GCS Research. He has worked as a Biological Science Technician for the Rocky Mountain Research Station. He performed an upgrade of the GIS software to ESRI ArcGIS 9. Created a GIS database for the Lolo and Bitterroot National Forests as part of a project interrelating fire regimes and riparian ecosystems. Collected field data in upland and riparian forest ecosystems. Integrated collected field data into GIS database in order to perform statistical analysis. Used ArcHydro and 10m mosaicked DEMs from USGS to delineate watershed boundaries and study areas, and to calculate 3-dimensional drainage areas. Compiled detailed maps of each study area.

Additionally, Marcus has experience as a Research Assistant with the University of Montana Geography Department. In this capacity, he assisted the Data collection team in all aspects of sediment core retrieval in winter conditions. Sleds and snowshoes were used to transport gear to and from the remote study

sites. Mapping-grade GPS units (Trimble GeoExplorer 3) were used in conjunction with a total station to collect detailed and accurate field data. Metadata and attribute information were constructed using GPS pathfinder office. The field data was downloaded to the main database, differentially corrected and integrated into the existing basemap layers of USGS Digital Orthophotos, Digital Raster Graphic Quads, and previously collected data using ArcGIS 9. Online Internet Mapping Services (IMS) from NRIS were employed in conjunction with other data such as regional DEMs and cadastral information using the Spatial Analysis extension of ArcGIS to identify future potential study sites meeting complex criteria.

Marcus has developed several geodatabases for GCS Research Services projects, including the geodatabase for the Montana Means Business web application and a geodatabase for a large security project for Regan National Airport and the Potomac Basin Security System.

EDUCATION:

Master's in Geography (GIS and Cartography option)

The University of Montana

Bachelor's in Anthropology, minor in Native American Studies, Graduated 2002

The University of Montana

Job-related educational course details:

Graduate Seminar in GIS - Planned and implemented a GIS project to predict areas of high speed wireless internet coverage based on tower locations near Missoula, Montana. ESRI ArcGIS 9.x Spatial Analysis was used to analyze, classify, and rank coverage using a mosaicked 10m digital elevation model.

Geographic Field Techniques - Used Mapping-grade carrier-phase GPS units (Trimble GeoExplorer 3) and a total station to survey plant and tree communities as well as topographic landforms such as stream cross-sections and landslide debris piles. Metadata was constructed, edited, and integrated into the GIS. The field data was downloaded and integrated into existing GIS base layers consisting of DEMs, USGS DRGs and DOQs. Detailed cartographic maps were produced.

Internet GIS - ESRI ArcIMS and ArcGIS products were used to plan, construct, and customize an internet mapping service concerning Montana fire perimeters for 2000. A mosaic of 30m DEMs for western Montana was integrated into an online GIS with fire perimeter data. ArcScene was employed to construct a 3-dimensional map of the burn areas. The project was loaded onto an internet server at the University of Montana and distributed across the web. The ArcIMS viewer was heavily customized using html code and gif animations. The database was administered and maintained for the duration of the semester.

6.0 PROJECT COST

GCS Research is submitting a fixed-firm project cost. GCS Research guarantees the deliverables to meet or exceed the requirements establish in the Master Contract CEP 07-DOA-GIS-16 Statement of Work.

Task Number	Task Description	GCS Project Manager Michael Beltz	Senior GIS Analyst Miles Wacker	GIS Specialist Marcus Reddish	John Waterman Dir. of Geospatial Services	TOTAL HOURS	TOTAL COST
	HOURLY RATE	$125	$75	$75	$125		
1.0	**Project Management**						
1.1	Project Kick-Off	8	8			16	$1,600.00
1.2	Phone Calls, Emails	6	6			12	$1,200.00
1.3	Weekly Progress Reports	6	6			12	$1,200.00
1.4	Final Delivery and Review		3		6	9	$975.00
	Task 1.0 Sub-Totals	**20**	**23**		**6**	**49**	**$4,975.00**
2.0	**Deliverable One - Geodatabase**						
2.1	Base Map Set Up and Data Assembly		4	4		8	$600.00
2.2	Digitize Historic Districts		50	50		100	$7,500.00
2.3	FGDC Metadata		5			5	$375.00
	Task 2.0 Sub-Totals		**59**	**54**		**113**	**$8,475.00**
3.0	**Deliverable Two- Geodatabase (Points)**						
3.1	Digitize Points		95	95		190	$14,250.00
3.2	FGDC Metadata		5			5	$375.00
	Task 3.0 Sub-Totals		**100**	**95**		**195**	**$14,625.00**
	Total Hours	**20**	**182**	**149**	**6**	**357**	
							TOTAL PROJECT COST: $28,075.00